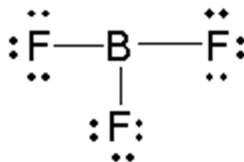
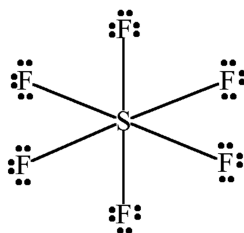


Exceptions to Octet Rule

The localized electron model is a simple but successive model. It applies to most compounds, but there are some molecules that do not quite fit into the model. Some of these, such as boron, do not satisfy the octet rule by having less electrons around the central atom. An example is boron trifluoride:



Other elements, such as sulfur and phosphorus, can exceed the octet rule. An example is sulfur hexafluoride:



Summary about Octet Rule:

- The second-row elements C, N, O, and F should always be assumed to obey the octet rule.
- The second-row elements B and Be often have fewer than eight electrons around them in their compounds. These electron-deficient compounds are very reactive.
- The second-row elements never exceed the octet rule, since their valence orbitals (2s and 2p) can accommodate only eight electrons.
- Third-row and heavier elements often satisfy the octet rule but can exceed the octet rule by using their empty valence d orbitals.
- When writing the Lewis structure for a molecule, satisfy the octet rule for the atoms first. If electrons remain after the octet rule has been satisfied, then place them on the elements having available d orbitals (elements in Period 3 or beyond).

Example:

Write the Lewis structure for PCl_5 .

See handwritten sheet for example

Practice Questions:

